ABSTRACT

A process for creating a broadly tunable Distributed Bragg Reflector (DBR) with a reduced recombination rate. According to the current invention, this may be achieved by creating electron confinement regions and hole confinement regions in the waveguide of the DBR. Preferably, this is achieved by engineering the band gaps of the DBR waveguide and cladding materials. Preferably, the materials selected for use in the DBR may be lattice matched. Alternately, two or more thin electron confinement regions and two or more thin hole confinement regions may be created to take advantage of strain compensation in thinner layers thereby broadening the choices of materials appropriate for use in creating a broadly tunable DBR. Alternately, graded materials and/or graded interfaces may be created according to alternate processes according to the current invention to provide effective electron and/or hole confinement regions in various DBR designs.